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ABSTRACT

The skilled performance of conference interpreters has aroused some interest of late, both on the part of interpreters interested in studying their own complex skills, and of psychologists interested in cognitive behavior. Recent theories in this field have concentrated on information processing aspects of the task, and on the role of anticipatory processes in understanding the source language speaker. These theories are discussed in the light of current approaches to the role of the organization of knowledge and inference processes in the understanding of discourse. It is suggested that conference interpreters are highly skilled professional bilinguals who constitute a potentially valuable source of data for testing theories of cognitive aspects of bilingualism. (Author)

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Conference interpretation: A review of recent theory and research

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Introduction

The purpose of the present discussion is to review theoretical approaches to the complex skills involved in conference interpretation, and to suggest ways in which recent theory and research on the role of knowledge structures and inference processes in the understanding of language and memory for discourse can be applied to the analysis of the interpreter's skills. The potential contribution of the study of interpreting within this framework to the understanding of cognitive aspects of bilingualism will also be discussed.

The task of the conference interpreter is to listen to discourse in one (source) language, and to repeat it in another language, either while it is being spoken (simultaneous interpretation), or as soon as the source language speaker has finished (consecutive interpretation). In referring to oral translation it is customary to refer to "interpretation" rather than "translation", since a more immediate transposition of the total meaning of a message, utilizing both verbal and non-verbal aspects of the source language speaker's behaviour is held to be involved than is the case with more studied, written, forms of translation (Nilski, 1969; Selescovitch, 1976). Though the skilled performance of conference interpreters would appear to be of great potential interest to psychologists studying bilingualism, the understanding of language, memory and attention, the psychological literature in this area is rather sparse. In a review of research Gerver (1976) was only able to discover 20 research papers or theses on aspects of conference interpretation. The research discussed in the 1976 review was almost solely concerned with aspects of simultaneous interpretation, and covered: ear-voice span (Oléron and Nanpon, 1965; Treisman, 1965); the effects of redundancy of the source language text on performance in simultaneous interpretation (Lawson, 1967; Treisman, 1965);

the effects of source language input rate on interpreters' performance (Chernov, 1969; Gerver, 1969; Krusina, 1971); the effects of noise on interpreters' performance (Gerver, 1972, 1974); segmentation of the source language message (Barik, 1969; Gerver, 1971; Goldman-Eisler, 1972); the effects of simultaneous listening and speaking (Barik, 1973; Gerver, 1972, 1974; Goldman-Eisler, 1968; Pinter, 1969). Dependent variables examined in these studies included: ear-voice span; output speech rate; the distribution of unfilled hesitation pauses in the interpreter's output in relation to their distribution in source language input; analyses of interpreters' output in terms of errors, omissions, additions, and self-corrections. Very little has been added to the research literature since 1976.

Models of simultaneous interpretation

Gerver (1976) also discussed two models of some of the processes involved in simultaneous interpretation. Chernov (1973) proposed a "psycholinguistic" model of simultaneous interpretation which concentrated on the processes of inference and prediction involved in having to decode the source language message under the time constraints imposed by simultaneous interpretation. Chernov suggested that, in listening to the source language message, the simultaneous interpreter generates and attempts to verify hypotheses about the source language input using linguistic and non-linguistic cues. Among the variables influencing the simultaneous interpreter's predictions regarding the source language text might be: familiarity with the subject under discussion; assumptions about the speaker's communicative goals; the overall context of communication at the time. Chernov (1979) has since made clear that, in listening to the source language message, the simultaneous interpreter generates and attempts to verify hypotheses at the level of the semantics, rather than the grammatical structure, of

the message. In dealing with the actual process of translation Chernov (1979) refers only to "anticipatory synthesis in the re-generation of the message in the target language". The model, then, is limited mainly to the problem of understanding the source language message under time constraints, and does not deal with more general problems of translation, or of memory and attention which arise in considering simultaneous interpretation.

Analysis of the experimental data led Gerver (1971, 1976) to propose a more comprehensive, information processing model of simultaneous interpretation. The interpreter's task was characterised in terms of the following operations vis-a-vis the source language message: listening, storing, retrieving, analysing, synthesizing, and transforming the source language message into the target language, uttering the target language message, monitoring for errors before or after output. In analysing the interpreter's task in this way the question arises as to whether these tasks are carried out sequentially or in parallel. An information processing model was proposed in which particular attention was paid to aspects of memory and the sharing of attention in simultaneous interpretation, and is illustrated in Figure 1.

- Figure 1 about here -

Two main aspects of the model should be noted: (1) Permanent structural features, such as short-term input and output buffer memories, and long-term memory for languages and general background knowledge; (2) Control processes which can be selected at the option of the interpreter, and which can also determine the distribution of attention and effort among the different elements of the task.

The distinction between permanent and control processes is derived from Atkinson and Shiffrin (1968). Though no interest has been

shown in such questions as the type of storage mechanisms for the bilingual's languages (i.e. interdependent-independent) a number of writers have discussed the problem of memory in simultaneous interpretation. Two professional interpreters, Van Hoof (1962) and Hromosova (1972) discussed the problem of memory in relation to the complexity of the interpreter's task. Referring to the number of tasks simultaneous interpreters appear to carry out at the same time, Van Hoof (1962) spoke of "split" memory or attention. Hromosova (1972) referred to simultaneity and the interaction between short-and long-term memory as "three-track" memory: as the source language starts, the interpreter begins to store, as he stores he also brings into short-term memory his knowledge of the vocabulary and grammar of both source and target languages, then while he is pronouncing his translation, the cycle continues.

Review of the experimental literature, however, suggested a more complex picture than that sketched by Hromosova. Ear-voice span data, which demonstrated that the interpreter can lag from 2 to 10 seconds behind the source language speaker without omitting any of the input (Gerver, 1971; Oleron and Nanpon, 1965) suggested that some form of short-term buffer memory is involved in order to account for the amount of new source language information the interpreter can store while translating a previously received portion of the message. In the flow chart, source language input is shown as being received in short-term buffer storage, which is monitored, and is under the control of an input routine (control process). The input routine is sensitive to the state of the environment (e.g. whether source language input is available), to the state of the buffer store (whether further input can be accepted or whether recent input is fading), and can also implement the interpreter's strategy for segmenting source language discourse.

In order to account for the interpreter's ability to translate

while further information is received and stored, a relatively short-term working or operational memory was proposed. The term "operational" memory was originally suggested by Posner (1967) to describe the type of memory involved in the active reinstatement of permanently stored information. The term seems particularly applicable to the type of process involved when an interpreter accesses information regarding source and target languages, and carries out the operations involved between perception of the source language message and vocalisation of the target language translation of that message. In the flow chart working memory includes all of the operations after retrieval of information from buffer storage. Long-term storage of lexicons and grammars of both source and target languages is indicated in the flow chart by the legends for source and target language "code" books. Finally, the ability of interpreters to monitor and correct their own target language output, discussed with examples in Gerver (1974), suggested the need for some form of output buffer storage. It was suggested that, although the main focus of an interpreter's attention might be the actual translation of a message, information would be acquired simultaneously in buffer storage while a running comparison could be carried out between current output, or proposed output, and previous input. Under normal circumstances (e.g. good listening conditions, moderate input rate, easily grasped source language message etc.) an interpreter would easily be able to divide his attention between the various functions displayed in the flow chart. When coping with difficult listening conditions (Gerver, 1974), and/or difficult subject matter, however, attention might be focussed on decoding or on encoding, and monitoring of both input and output might suffer.

The flow chart refers briefly to processes involved in the decoding of the source language, and its subsequent encoding in the target language. In the flow chart the first instruction "Decode and

store" accesses a "code-book" enabling the interpreter to decode the phonetic representation of each segment of the source language and understand it in terms of its underlying meaning in relation to context. The decoded message remains available both for encoding in the target language, and for comparison with the resulting utterance. The terms "surface" and "deep" in the flow chart refer to the words heard and uttered by the interpreter and to his understanding of their meaning. Indirect evidence for decoding into an abstract meaning representation comes from two sources. First of all, there is the commonly held belief among many interpreters that they forget the words they may just have heard in a source language almost as soon as they hear them, and that what is translated is not the words, but the meaning of the original message (Selescovitch, 1968). Secondly, research has demonstrated that subjects are more likely to recall the gist of a passage than the exact words it was presented in (Sachs, 1967). In bilinguals, Rosenberg and Simon (1977) have shown that subjects were frequently unable to remember whether they had seen a particular sentence in French or only its translation in English.

Some suggestions about the type of knowledge an interpreter must have about his languages were made by Nida (1969), who suggested that translators must not only know the rules for generating sentences in different languages, but they must also know the levels at which rule systems correspond. He also stresses that this is not the only form of knowledge required in translation because translators do not simply mpa the syntactic forms of one language onto those of another. Nida suggests that the interpreter must first of all decode the source language into some abstract form before restructuring it in the target language, but that experienced simultaneous interpreters may often short-circuit the deeper level of analysis by selecting frequently

occurring surface structure correspondences; that is, they will often be able to predict the target language equivalent without analysing the input completely.

It was suggested that the interpreter might compare earlier input with current output by means of a running analysis of sound, meaning and structure, and that one form such an analysis might take would be similar to the analysis-by-synthesis model of speech recognition (Halle and Stevens, 1964). Halle and Stevens proposed that speech recognition involves the internal synthesis of speech patterns according to certain rules, and the matching of internally generated speech patterns against the pattern under analysis. The generative rules employed for speech perception would be similar to those used for speech production. Neisser (1967) pointed out that such rules need not be restricted only to the analysis of speech sounds, but could encompass larger units, such as words, constituents and sentences as well. After analysis and synthesis of the source language message, the interpreter might generate his translated version of the message in an analogous manner, the process of translation also involving the synthesis and analysis of possible translations of the source language message as understood by the interpreter. According to this point of view, monitoring, and the possibility of revision and correction are an integral part of the process of simultaneous interpretation, rather than an additional activity after translation.

More recent approaches: frames for knowledge, frames for interpretation

1) Frames for knowledge: While Gerver (1976) emphasised information processing aspects of simultaneous interpretation, Chernov (1979) concentrated on the role of predictive strategies in decoding the source language message. Two more recent papers (Karmiloff-Smith, 1978; Moser, 1978) develop these themes. Both Karmiloff-Smith's and Moser's approaches

to simultaneous interpretation are partly based on recent developments in the field of artificial intelligence, and in particular the work of Minsky (1975), and Schank (1975), who have both advanced theories of the organization of knowledge in which default (or inferred) knowledge plays an important anticipatory role in monolingual language understanding.

The role of inference in the understanding of language in everyday life has recently been stressed by Clark and Haviland (1976) and by Harris and Monaco (1978), and has been studied by Bower (1976), Thorndyke (1976) and others in relation to memory for stories. As Bower has pointed out, the inferences drawn from the events in a story depend upon knowledge of objects, persons, actions etc., or rather "world-knowledge" being carried over into the context being dealt with at any particular time. This knowledge can be conceptualised in terms of "schemata" (Bartlett, 1932), frames (Minsky, 1975), or scripts (Schank and Abelson, 1977), or rather frameworks for the organization of knowledge about different domains. The notion of "frame" is used to describe a memory structure representing knowledge about some large domain of the world. Frames are like concepts in so far as features of objects, situations etc. that fit the frame are specified, except that frames involve the organization of knowledge about more complex collections of information, such as objects, actions, and coherent collections of objects or actions. Frames may be called into memory to create internal descriptions of new objects which may be encountered, and Minsky (1975) speaks of "instantiating" a frame when filling in its variable features, or slots with the values of the event, object or experience in question. When some relevant information is missing, features associated with a prototypical concept can be used to provide inferred, or "default" information about the concept.

It has also been suggested that we can apply the "frame"

concept to the understanding of stories, and of discourse. For instance, we all know some general frames for simple stories, a grammar for which is suggested by Bower (1976). This "story grammar" might consist, for instance, of slots filled by a setting, a theme, a plot, and a resolution. Each of these slots would in turn be further specified as, for instance, in the case of the "setting" frame, which would consist of slots to be filled by the characters and/or the location and time of the story. One can view the story grammar as a set of good guesses about the slots of the story frame, slots which are filled by particular objects or events as we instantiate the general frame relevant to the particular story being dealt with at the time. Content isn't provided by the abstract story framework but by specific knowledge frames aroused by aspects of the story itself. As each object, event, character or action is mentioned the corresponding knowledge frame is brought into readiness so that the listener/reader is prepared to hear/read about any of the set of events associated with the frame. These inferences are directed by expectations and help fill out the scenario of the story.

The organisation of knowledge in semantic memory has also been discussed by Simon (1979) in relation to the concept of "scripts" (Schank and Abelson, 1977), or schemata which describe classes of event or event sequences in terms of which memory is organised. Simon (1979) suggests that scripts may have either a topical or an episodic character. Nodes of topical schemata (scripts) may represent objects, such as the Houses of Parliament, or concepts such as truth, revolution etc. Nodes of episodic schemata, on the other hand, represent a system of temporally and causally related events. For instance, a topically organised memory for "restaurant" could have associated with it all sorts of information about restaurants, their purpose, physical layout, organization, staffing, and so on. In an episodically organized memory,

however, the schema associated with restaurant could be in the form of a script describing the typical sequence of events that occur when one enters a restaurant: hanging up one's coat, requesting a table, being shown to a table, being seated at the table, consulting the menu, placing an order, and so on. Aspects of the psychological reality of scripts in memory for text have recently been demonstrated by Bower, Black and Turner (1979) in a series of experiments. They showed that subjects tended to agree on the nature and sequence of events when asked to provide scripts for specific situations, such as attending a lecture or visiting a doctor. In other studies these authors also examined various positive effects of script structure on recall of text.

2) Frames for interpreting: As students, interpreters will have to learn the subject matter, vocabulary, context and procedures associated with varied types of meeting, as well as become aware of the cultural, intellectual backgrounds of both speakers and their audiences, and learn to adapt their interpreting accordingly (Namy, 1978). It is reasonable to propose, therefore, that the different interpreting situations, and their associated variables, be viewed in terms of different interpretation frames, or topical and episodic schemata. Examples of some of the different types of meeting students can expect to encounter, and therefore of frames they must acquire, are given by Namy (1978): didactic - a lecturer addressing a class; rhetorical - the United Nations General Assembly; emotional - a preacher addressing a religious gathering; technical - a scientific conference; negotiating - a GATT trade negotiation group; legal - the International Court of Justice; diplomatic - a Summit Conference.

Now, it seems reasonable to suggest that, in the course of their training in their working languages, interpreters do indeed acquire frames, frames for conference settings, along with scripts and lexicons.

What are being acquired, however, are not only the skills involved in understanding and speaking the interpreter's working languages, but also the skill of mapping derived (understood) information in one language onto linguistically, culturally, and contextually appropriate structures in another language. Indeed, these are skills which may be said to be acquired by any competent bilingual. Werner (1966) discusses such skills in terms of cultural competence: "The ability of a native speaker of a language to distinguish culturally true from culturally false sentences is not part of his linguistic competence, but part of his cultural competence. In other words, cultural competence is the native speaker's ability to use language appropriately within the context of his culture". Werner goes on to specify two types of cultural competence reflected in sentence use: first, the use of sentences as statements about the socio-physical universe, and hence dealing with knowledge systems embraced by the majority in a cultural system; second, a native speaker-hearer's knowledge of "plans" representing a particular culture's way of manipulating the socio-political universe which embody sets of beliefs and actions which must be engaged in to accomplish particular cultural goals. The interpreter must be culturally competent in both senses in the languages he interprets both to and from. He must assess the knowledge (frame) systems of both the source language speaker and the audience.

In order to illustrate the type of knowledge a translator, and presumably an interpreter, should have in order to translate effectively Minsky (1975) discusses a fable cited by Chafe (1972): "There was once a wolf who saw a lamb drinking at a river and wanted an excuse to eat it. For that purpose, even though he himself was upstream, he accused the lamb of stirring up the water and keeping him from drinking ..." Minsky suggests that in order to understand this short fable at all it is

necessary to realise that the wolf is lying, that to understand the key conjunctive "even though" one must realise that contamination never flows upstream, and among the other things one must know are the meanings of upstream, stirring up, and why stirring up should prevent drinking. Presumably, frames for fables also contain slots for wolves such as: animate, mammal, not human, carnivorous, not nice, and with a tendency to like gobbling up little lambs. A fable frame slot for lamb, on the other hand, might contain the information: animate, mammal, not human, vegetarian, innocent, meek and easy prey to evil wolves! In translating this fable into Japanese, Chafe (1972) points out that it would be customary to mention the place on the river where the actors stand, as well as the time, even if only by a non-specific such as "in a certain place ..." This is not necessary in English, where even time need only, and not necessarily, be specified by "Once". Both time and place are required in the deeper meaning frames and Minsky suggests that default assignments (inferred entries) would be immediately available for a translator who had understood the passage at all. Minsky then goes on to apply his theory to simultaneous interpretation: "Good simultaneous translators proceed so rapidly that one wonders how much they can really understand before speaking: our theory makes this less of an issue because, if the proper frame is retrieved in the course of partial understanding, its' default assignments are available almost instantly, before more complex assignment negotiations are completed." (Minsky, 1975).

The importance of default extralinguistic knowledge in interpretation is discussed by Karmiloff-Smith (1978), who characterizes the interpreter's behaviour as follows: "The interpreter, while listening to a speaker is constantly updating his mini-theory of the speaker's semantic intentions. Each speech act is not only the

communication of new information, but the intricate interplay of new information and presuppositions based on the knowledge accumulated from the present discourse and extralinguistic knowledge. Thus, the content of each message unit enables the interpreter to form a temporary "knowledge framework" for the particular subject under discussion and to filter each new message through that framework." Karmiloff-Smith suggests that on perceiving the source language message the interpreter channels it through existing knowledge frames - what he knows about the topic under discussion. Thus ad-hoc specific task-oriented frameworks are formed which assist in filtering the specific discussion in a particular setting. It is through these task-oriented frameworks that the interpreter can continuously up-date his theory of what the source language speaker's communicative intentions are, his ability to predict the source language speaker's intentions increasing as the task-oriented frame is strengthened.

Karmiloff-Smith's schematic representation is intended to illustrate the importance of the dynamic formation of task-oriented frameworks and of previous knowledge in the interpreter's understanding process. As was the case with Chernov (1973, 1979) discussed above, and with Kade and Cartellieri (1971), Karmiloff-Smith concentrated on understanding the source language, rather than the process of translation into the target language. Kade and Cartellieri proposed that simultaneous interpretation involved a stochastic model of listening in which ".... the interpreter builds up within himself an expectation which gets more and more unambiguous with every entity of the source language text he has received". The role of anticipation in understanding the source language message is, then, common to all approaches to the interpreter's task discussed so far, and it also plays a central role in Moser's information processing model of simultaneous interpretation (Moser, 1976) which

incorporates the structural and functional components of Massaro's (1975) model of speech perception and understanding. In Moser's model the structural components describe the nature of the information stored at a given stage of processing, and include pre-perceptual auditory storage, storage of perceptual units, working memory or "Generated Abstract Memory" (Massaro, 1975) which includes all the processes involved in language understanding and translation, and long-term memory for source and target languages systems and general knowledge. Functional components, on the other hand, refer to the individual operations performed at a particular stage of processing, such as syntactic and semantic processing of word strings, the search for the appropriate conceptual base for a particular message, the activation of conceptual relations, and generation of a target language paraphrase.

Moser pays particular attention to the conceptual base from which an interpreter must work, and to the role of anticipation in interpretation. She proposes an interlingual conceptual base representing concepts underlying utterances irrespective of the language in which they are encoded. The network of concepts proposed by Moser is flexible and can be restructured and changed. Two types of connection between words and concepts are involved in the process of understanding for the interpreter: intra-lingual, between words and concepts in one language; inter-lingual, between the language specific nodes of the same concept. According to Moser, the interpreter faced with the explicit task of translation activates conceptual relations, together with the relevant interlingual relationships to express them in the target language: "The phenomenon of prediction in simultaneous interpretation can thus be viewed as a function of how fast, and how many, conceptual relations can be activated. In other words, the more the interpreter knows the more he can predict, and the better his knowledge about

anything ... the faster prediction can be." In simultaneous interpretation, however, the interpreter is predicting for someone else, i.e. the source language speaker. Prediction, therefore, means prediction of shared knowledge, and depends on the compatability of knowledge between the speaker and the interpreter. Moser (1978) discussed the possible implications of her model for training in simultaneous interpretation, and devised a pilot training programme based on both structural and functional aspects of the model.

Though Moser points to the role of prediction and the compatability of knowledge between source language speaker and interpreter, the interpreter's understanding task is not so different from that facing a listener in a normal dialogic situation (Karmiloff-Smith, 1978). Both the interpreter and "normal" listener are constantly up-dating their theories of the speakers' intentions. The difference between the two situations lies, not only in the fact that task-specific hypotheses are generated more quickly in simultaneous interpretation, but also in the fact that the interpreter must bear cross-cultural knowledge and goals in mind in so far as he has to predict for the target language listener as well as the source language speaker.

To date, then, theoretical and research interest has tended to focus on simultaneous, rather than consecutive, interpretation. Even so, there are points of overlap in any account of the two tasks. Whereas the simultaneous interpreter interprets as he hears the source language message, with a delay between input and output of anywhere from 2 to 10 seconds or more (Oleron and Nanpon, 1964), consecutive interpretation is carried out after the source language speaker has finished all, or part, of his delivery, and stretches of discourse of from a few seconds to over 40 minutes may be involved. Consecutive interpreters develop idiosyncratic note-taking skills during the course of their training

and working experience, which enable them to take concise notes as they listen to the source language message (Selescovitch, 1975). These notes, which are not in shorthand, are habitually made in the target language, and enable the interpreter to accurately reconstruct source language discourse in the target language. There appears no obvious reason to suppose that the role of inference processes and knowledge structures in bilingual language understanding should be any different in consecutive interpretation than in simultaneous interpretation. Even at the point the source language speaker finishes speaking, and the interpreter fluently reconstructs his target language version, it seems reasonable to propose that the notes he has taken serve as concise cues to just-acquired knowledge structures: frames immediately relevant to the discourse in question.

Interpreters as bilinguals

Martinet (1960) distinguished between the professional bilingualism of groups such as translators, and language teachers (and presumably interpreters), and the social bilingualism of particular populations such as French and English speaking Canadians, or Swiss-German and Romanish speaking Swiss of the Engadine. As Martinet pointed out, professional bilingualism is an isolated phenomenon compared with social bilingualism, yet Karmiloff-Smith (1978) suggests that the output from simultaneous interpretation might be considered close to normal discourse, and therefore more appropriate to the study and analysis of normal linguistic function than is often the case with data obtained from experimental studies. Among the points of contact between normal dialogic situations and simultaneous interpretation suggested by Karmiloff-Smith are: the role of anticipatory processes, the role of prior world knowledge in language understanding, communicative modulation of the message according to the context of communication, and

role-taking and turn-taking.

Studying the performance of skilled conference interpreters may well provide more accurate insights into cognitive aspects of bilingualism than data obtained from social bilinguals placed in such laboratory situations as those tasks involving reaction time, or the learning of mixed language word lists reviewed by McCormack (1977). Even so, it would be interesting to see whether theories of bilingual memory based on such data would hold up when compared with results from similar experiments carried out with professional interpreters, highly skilled in language switching, serving as subjects. Furthermore, research with interpreters may shed light on the nature of semantic systems in bilingualism. As was illustrated in the example of the fable of the wolf and the lamb, default knowledge may be made explicit in translation. The extent to which such knowledge is shared, and thus part of a common semantic system, or whether it is part of separate semantic systems, and therefore of language/culture specific frames, could be investigated by presenting carefully prepared texts to experienced simultaneous interpreters.

A further advantage of data obtained from simultaneous interpretation is that it represents a unique source of information on comprehension in real-time, comprehension reflecting the reality of goal-oriented communication and the communicative competence of the interpreter as speaker. Apart, then, from the interest of research on conference interpretation in its own right, analysis of what an interpreter knows and does may well help to further our understanding of some of the outstanding psychological and linguistic questions in both bilingualism and language understanding in general.

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